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Remarks

This patent application now believed to be in allowable condition for reasons set forth below with respect to all of the pending claims.

Claim 1 has been revised to incorporate the allowable subject matter of claim 2 which has been cancelled. Claim 3 has been revised to depend from claim 1, and claim 4 depends from claim 3.

Claim 5 has been cancelled, but its subject matter has been incorporated along with the subject matter of claim 1 into each of the newly amended independent claims 6 and 7 whose subject matter was indicated to be allowable. Claim 8 depends from claim 7.

Claims 9, 10 and 11 have been rewritten into independent format to incorporate their allowable subject matter, and claim 12 depends from claim 11.

Claim 13 has been cancelled, but its subject matter has been incorporated into amended independent claim 14 which also incorporates the subject matter of prior claim 1. Furthermore, claim 15 depends from claim 14.

Finally, independent claim 16 has been again amended to incorporate the allowable subject matter of both claims 6 and 14.

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For the reasons set forth above, it is respectfully submitted that this application is now in an allowable condition such that it is appropriate to respectfully solicit its allowance.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE**In The Claims:**

1. (Twice Amended) Apparatus for forming heated glass sheets comprising:

a housing having a heated chamber;

an upper mold support assembly for supporting an upper mold within the heated chamber for cyclical vertical movement between upper and lower positions;

a lower mold shuttle for supporting a lower mold for cyclical movement between an idle position horizontally spaced from the upper mold and a use position below the upper mold; [and]

a lower mold support assembly to which the lower mold is cyclically transferred from the lower mold shuttle in the use position to provide support thereof while permitting horizontal alignment of the lower mold with the upper mold as necessary upon each cycle of downward movement of the upper mold for cooperation of the molds to form a heated glass sheet between the molds; and

vertically movable rollers having an upper position that supports the lower mold shuttle during the cyclical movement of the lower mold between the idle and use positions and having a lower position at which the lower mold shuttle is moved downwardly with the lower mold in the use position to provide the cyclical transfer of the lower mold to the lower mold support assembly.

3. (Twice Amended) Apparatus for forming glass sheets as in claim [2] 1 further comprising horizontal positioners that cooperate with the rollers to support and guide the lower mold shuttle during the cyclical movement of the lower mold between the idle and use positions.

6. (Amended) Apparatus for forming heated glass sheets [as in claim 5 wherein] comprising:

a housing having a heated chamber:

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an upper mold support assembly for supporting an upper mold within the heated chamber for cyclical vertical movement between upper and lower positions;

a lower mold shuttle for supporting a lower mold for cyclical movement between an idle position horizontally spaced from the upper mold and a use position below the upper mold; and

a lower mold support assembly to which the lower mold is cyclically transferred from the lower mold shuttle in the use position to provide support thereof while permitting horizontal alignment of the lower mold with the upper mold as necessary upon each cycle of downward movement of the upper mold for cooperation of the molds to form a heated glass sheet between the molds, the lower mold support assembly including four lower supports that support the lower mold in the use position below the upper mold, and each lower support [includes] including a liquid cooled ball.

7. (Amended) Apparatus for forming heated glass sheets [as in claim 5 wherein] comprising:

a housing having a heated chamber;

an upper mold support assembly for supporting an upper mold within the heated chamber for cyclical vertical movement between upper and lower positions;

a lower mold shuttle for supporting a lower mold for cyclical movement between an idle position horizontally spaced from the upper mold and a use position below the upper mold; and

a lower mold support assembly to which the lower mold is cyclically transferred from the lower mold shuttle in the use position to provide support thereof while permitting horizontal alignment of the lower mold with the upper mold as necessary upon each cycle of downward movement of the upper mold for cooperation of the molds to form a heated glass sheet between the molds, the lower mold support assembly including four lower supports that support the lower mold in the use position below the upper mold, and each lower support [includes] including a liquid cooled pad.

9. (Amended) Apparatus for forming heated glass sheets [as in claim 5 further including] comprising:

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a housing having a heated chamber;

an upper mold support assembly for supporting an upper mold within the heated chamber for cyclical vertical movement between upper and lower positions;

a lower mold shuttle for supporting a lower mold for cyclical movement between an idle position horizontally spaced from the upper mold and a use position below the upper mold; and

a lower mold support assembly to which the lower mold is cyclically transferred from the lower mold shuttle in the use position to provide support thereof while permitting horizontal alignment of the lower mold with the upper mold as necessary upon each cycle of downward movement of the upper mold for cooperation of the molds to form a heated glass sheet between the molds, the lower mold support assembly including four lower supports that support the lower mold in the use position below the upper mold, a pair of support members each of which mounts two of the lower supports, the support members mounting a support and stop member, and a gas jet pump array that is supported and positioned by the support and stop member.

10. (Twice Amended) Apparatus for forming heated glass sheets [as in claim 1 wherein] comprising:

a housing having a heated chamber;

an upper mold support assembly for supporting an upper mold within the heated chamber for cyclical vertical movement between upper and lower positions;

a lower mold shuttle for supporting a lower mold for cyclical movement between an idle position horizontally spaced from the upper mold and a use position below the upper mold, and the lower mold shuttle [includes] including a lock that secures the lower mold against movement on the lower mold shuttle along its direction of travel during the cyclical movement between the idle and use positions; and

a lower mold support assembly to which the lower mold is cyclically transferred from the lower mold shuttle in the use position to provide support thereof while permitting horizontal alignment of the lower mold with the upper mold as necessary upon each cycle of downward movement of the upper mold for cooperation of the molds to form a heated glass sheet between the molds.

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11. (Amended) Apparatus for forming heated glass sheets [as in claim 1 wherein] comprising:

a housing having a heated chamber;

an upper mold support assembly for supporting an upper mold within the heated chamber for cyclical vertical movement between upper and lower positions;

a lower mold shuttle for supporting a lower mold for cyclical movement between an idle position horizontally spaced from the upper mold and a use position below the upper mold, and the lower mold shuttle [has] having a tubular construction through which a liquid coolant flows to provide cooling; and

a lower mold support assembly to which the lower mold is cyclically transferred from the lower mold shuttle in the use position to provide support thereof while permitting horizontal alignment of the lower mold with the upper mold as necessary upon each cycle of downward movement of the upper mold for cooperation of the molds to form a heated glass sheet between the molds.

14. (Amended) Apparatus for forming heated glass sheets [as in claim 13 further including] comprising:

a housing having a heated chamber;

an upper mold support assembly for supporting an upper mold within the heated chamber for cyclical vertical movement between upper and lower positions;

a lower mold shuttle for supporting a lower mold for cyclical movement between an idle position horizontally spaced from the upper mold and a use position below the upper mold;

a lower mold support assembly to which the lower mold is cyclically transferred from the lower mold shuttle in the use position to provide support thereof while permitting horizontal alignment of the lower mold with the upper mold as necessary upon each cycle of downward movement of the upper mold for cooperation of the molds to form a heated glass sheet between the molds; and

a quench station including lower and upper quench modules for supplying a quench gas, a quench shuttle that supports and cyclically moves quench ring between: (a) a transfer position below the upper mold in the heated chamber where the quench ring is

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movable horizontally on the quench shuttle as necessary into alignment with the upper mold upon downward movement of the upper mold to deposit a formed glass sheet supported thereby onto the quench ring; and (b) a quench position between the lower and upper quench modules to provide quenching of the formed glass sheet on the quench ring, and a lock for preventing horizontal movement of the quench ring on the quench shuttle during movement between the transfer and quench positions.

15. (Amended) Apparatus for forming glass sheets as in claim [13] 14 wherein the quench station includes a railway having a pair of spaced rails, the quench shuttle including a pair of spaced shuttle members having supported ends that are respectively supported by the pair of spaced rails for the movement of the quench shuttle; and the pair of spaced shuttle members including a pair of cantilevered ends that support the quench ring in a spaced and otherwise unconnected relationship.

16. (Thrice Amended) Apparatus for forming glass sheets comprising:
a housing having a heated chamber;
an upper mold supported within the heated chamber for cyclical vertical movement between an upper position and a lower position;
a lower mold for cooperating with the upper mold to provide forming of a heated glass sheet;
a lower mold shuttle that supports the lower mold for cyclical movement between an idle position horizontally spaced from the upper mold and a use position below the upper mold, and the lower mold shuttle including a lock that secures the lower mold against movement on the lower mold shuttle along its direction of travel during the cyclical movement between the idle and use positions;

a lower mold support assembly to which the lower mold is cyclically transferred from the lower mold shuttle in the use position to provide support thereof while permitting horizontal movement of the lower mold on the lower mold shuttle;

alignment guides that cooperate to move the lower mold horizontally on the lower mold support assembly as necessary into alignment with the upper mold upon each cycle

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of downward movement of the upper mold to the lower position to provide the glass sheet forming; and

a quench station including lower and upper quench modules for supplying a quench gas, [and] a quench shuttle that supports and cyclically moves a quench ring between: (a) a transfer position below the upper mold in the heated chamber where the quench ring is movable horizontally on the quench shuttle as necessary into alignment with the upper mold upon downward movement of the upper mold to deposit a formed glass sheet supported thereby onto the quench ring; and (b) a quench position between the lower and upper quench modules to provide quenching of the formed glass sheet on the quench ring, and a lock for preventing horizontal movement of the quench ring on the quench shuttle during movement between the transfer and quench positions.